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## The National Animal Disease Center



## **PUBLICATIONS:74**

ARS-NC-27

### UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

NORTH CENTRAL REGION
NATIONAL ANIMAL DISEASE CENTER
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The National Animal Disease Center at Ames, Iowa, is the U.S. Department of Agriculture's research facility for the study of livestock diseases that occur in the United States.

The Center's goal is to provide knowledge and research data needed to diagnose, prevent, control, or eradicate domestic animal diseases that have national significance and/or cause serious economic loss.

The articles listed in this publication were prepared by members of the Center's Agricultural Research Service and Animal Plant Health Inspection Service scientific staff during calender year 1974. The papers involve independent and interdisciplinary studies in the fields of bacteriology, biochemistry, biophysics, mycology, pathology, physiopathology, and virology. The list also contains a limited number of publications relating to experimental animal production, biological safety, and other support or service activities available within the NADC.

P. A. O'Berry

Director

- 1. ALBRECHT R.\*, HOROWITZ S.\*, GILBERT E.\*, HONG R.\*, RICHARD J. L., and CONNOR, D. H.: Dermatophilus congolensis chronic nodular disease in man. Pediatrics, 53 (6): 907-912, June 1974.
- 2. ALHAJI I.\*, JOHNSON D. W.\*, MUSCOPLAT C. C.\*, THOEN C. O.: Diagnosis of *Mycobacterium bovis* and *Mycobacterium paratuberculosis* infections in cattle by in vitro lymphocyte immunostimulation. Amer. J. Vet. Res. 35 (5):725-727, May 1974.
- 3. ALLISON M. J., ROBINSON I. M., BAETZ A. L.: Tryptophan biosynthesis from indole-3-acetic acid by anaerobic bacteria from the rumen. J. Bacteriol. 117 (1):175-180, Jan. 1974.
- BAETZ A. L., HUBBERT W. T.: Vitamin A in the bovine fetus. Amer. J. Vet. Res. 35 (9):1189-1190, Sept. 1974.

- 7. BARNETT D, KLUGE J. P.: Ultrastructural diagnosis of bovine papular stomatitis. Ann. Proc. Amer. Assoc. Vet. Lab. Diag. 17:255-266, Oct. 1974.
- 8. BOOTHE A. D., VAN DER MAATEN M. J.: Ultrastructural studies of a visna-like syncytia-producing virus from cattle with lymphocytosis. J. Virol. 13 (1):197-204, Jan. 1974.
- 9. BRAYMEN D. T., SONGER J. R., SULLIVAN J. F.: Effectiveness of footwear decontamination methods for preventing the spread of infectious agents. Lab. Anim. Sci. 24 (6):888-894, Dec. 1974.
- BREWER H. B.\*, JR., FAIRWEL T.\*, RITTEL W.\*, LITTLEDIKE E. T., ARNAUD C. D.\*: Recent studies on the chemistry of human, bovine and porcine parathyroid hormones. Amer. J. Med. 56(6): 759-766, June 1974.

# PUBLICATIONS: 74



- 5. BAETZ A. L., KEMENY L. J., GRAHAM C. K.: Blood chemical changes in growing pigs exposed to aerosol of *Bordetella bronchiseptica*. Amer. J. Vet. Res. 35 (3):451-453, March 1974.
- BAIREY M. H., VOGEL J. H.: Erysipelas immunizing product review. Proc. U.S. Anim. Health Assoc. 77:340-344, Oct. 1973. (publ. 1974)

- 11. BROWN R. W.: Compounds affecting Streptococcus agalactiae growth in milk. J. Dairy Sci. 57 (7):797-802, July 1974.
- 12. BROWN R. W., SHUMAN R. D., NORD N., McDONALD J. S., ROSE D. L.: Staphylococcal *alpha* antitoxin and antibodies to extracellular antigens of staphylococci and micrococci in the serums of dairy cows. Cornell Vet. 64 (4):559-572, Oct. 1974.
- 13. CARBREY E. A., BEARD C.\*, COOPER R.\*, HANSEN R. P.\*, POMEROY B. S.\*,: Hemagglutination and hemagglutination-inhibition tests with Newcastle disease virus Microtiter technique. Proc. Amer. Assoc. Vet. Lab. Diag. 17:1-6, Oct. 1974.
- CARBREY E. A., DOWNING D. R., SNYDER M. L., WESSMAN S. J., GUSTAFSON G. A.: Microtiter and automated serologic techniques for diagnostic virology. Proc. U.S. Anim. Health Assoc. 77: 553-562, Oct. 1973. (publ. 1974)
- 15. CUTLIP R. C.: Ultrastructure of the synovial membrane of lambs affected with chlamydial polyarthritis. Amer. J. Vet. Res. 35 (2):171-176, Feb. 1974.

- 16. DAVIS R. M., STONE S. S., GLAZIER R. M.: A method to demonstrate the specificity and sensitivity of fluorescent antibody by immunoelectrophoresis and immunodiffusion using ultraviolet light photography. J. Immunol. Methods 5 (1):49-53, May 1974.
- 17. DONTA S. T.\*, MOON H. W., WHIPP S. C.: Detection of heat-liable *Escherichia coli* enterotoxin with the use of adrenal cells in tissue culture. Science 183 (4122):334-336, Jan. 25, 1974.
- 18. DONTA S. T.\*, MOON H. W., WHIPP S. C., SKARTVEDT S. M.: In vivo production and inactivation of *Escherichia coli* enterotoxin. Gastroenterology 67 (5):983-990, Nov. 1974.
- 19. DOUGHERTY R. W., GAGNE A. F.\*: A versatile hydraulic operating table. Cornell Vet. 64 (1):11-19, Jan. 1974.
- 20. ELLINGHAUSEN H. C., Jr.: Virulence, nutrition and antigencity of *Leptospira interrogans* serotype *pomona* in supplemented and nutrient deleted bovine albumin medium. Ann. Microbiol. (Paris) 124B (4): 477-493, Dec. 1973.
- 21. ELLIS E. M., HARRINGTON R. Jr.: New methods for the isolation and identification of anaerobic bacteria. Proc. Amer. Assoc. Vet. Lab. Diag. 17:77-84, Oct. 1974.



22. ERICKSON G. A., MARE C. J.\*, PEARSON J. E., CARBREY E. A.: The goat as a sentinel for Venezuelan equine encephalomyelitis virus activity. Amer. J. Vet. Res. 35 (12):1533-1536, Dec. 1974.



- 23. ERICKSON G. A., PROCTOR S. J., PEARSON J. E., GUSTAFSON G. A.: Diagnosis of duck virus enteritis (duck plague). Proc. Amer. Assoc. Vet. Lab. Diag. 17:85-90, Oct. 1974.
- GILLETTE K. G.: Avian infectious bronchitis: Demonstration of serum IgG- and IgM-neutralizing antibody by sucrose density-gradient centrifugation and mercaptoethanol reduction. Avian Dis. 18 (4):515-525, Oct.-Dec. 1974.
- GOING R. L.\*, JACOBSON N. L.\*, BIETZ D. C.\*, LITTLEDIKE E. T., WIGGER K. D.\*: Prevention of parturient paresis by a prepartum, calcium-deficient diet. J. Dairy Sci. 57 (10):1184-1188, Oct. 1974.
- HARRINGTON R. Jr., HULSE D. C., ELLIS E. M.: Bacteria isolated from imported salted duck eggs. Avian Dis. 18(2) 240-242, April-June 1974.
- 27. HARRINGTON R. Jr., WOOD R. L., HULSE D. C.: Comparison of a fluorescent antibody technique and cultural method for the detection of *Erysipelothrix rhusiopathiae* in primary broth cultures. Amer. J. Vet. Res. 35 (3):461-462, March 1974.
- 28. HEDDLESTON K. L., REBERS P. A.: Fowl cholera bacterins: Host-specific cross-immunity induced in turkeys with *Pasteurella multocida* propagated in embryonating turkey eggs. Avian Dis. 18(2):213-219, April-June 1974.

- 29. HOFF G. L.\*, BIGLER W. J.\*, PROCTOR S. J., STALLINGS L. P.\*: Epizootic of canine distemper virus infection among urban raccoons and gray foxes. J. Wildlife Dis. 10 (4):423-428, Oct. 1974.
- 30. HOFF G. L.\*, BIGLER W. J.\*, TRAINER D. O.\*, DEBBIE J. G.\*, BROWN G. M., WINKLER W. G.\*, RICHARDS S. H.\*, REARDON M.\*: Survey of selected carnivore and opossum serums for agglutinins to Brucella canis. J. Amer. Vet. Med. Assoc. 165 (9):830-831, Nov. 1, 1974.
- 31. HUBBERT W. T.: Factors affecting survival of the bovine fetus and neonate. Theriogenology 1 (1):15-34, Jan. 1974.
- 32. HUBBERT W. T.: Relationship of unkeratinized skin to bovine fetal mummification: An hypothesis. Can. J. Comp. Med. 38 (2):203-206, April 1974.

- 33. HUBBERT W. T., BOOTH G. D., BOLTON W. D.\*: Summarizing data on bovine abortions with the aid of a computer. Proc. U.S. Anim. Health Assoc. 77:500-508, Oct. 1973. (publ. 1974)
- 34. HUBBERT W. T., HUGHES D. E., STALHEIM O. H. V., BOOTH G. D.: Weight changes of rhombenecephalon and eye lens in the developing bovine fetus. Amer. J. Vet. Res. 35 (6):769-772, June 1974.
- 35. HUBBERT W. T., MILLER W. J.\*: Immunogenetic ontogeny of cellular membrane function: A review. J. Cell. Physiol. 84 (3):429-444, Dec. 1974.
- 36. KENT T. H.\*, MOON H. W.: The comparative pathogenesis of some enteric diseases. Vet. Pathol. 10(5):414-469, 1973.
- 37. LAMBERT G., McCLURKIN A. W., FERNELIUS A. L.: Bovine viral diarrhea in the neonatal calf. J. Amer. Vet. Med. Assoc. 164 (3):287-289, Feb. 1, 1974.





- 38. LARSEN A. B., MERKAL R. S., MOON H. W.: Evaluation of a paratuberculosis vaccine given to calves before infection. Amer. J. Vet. Res. 35 (3):367-369, March 1974.
- LITTLEDIKE E. T.: Parturient hypocalcemia, hypomagnesemia, mastitis-metritis-agalactia complex of swine. Pages 355-389 in B. Larsen and V. Smith, eds. Lactation, a comprehensive treatise, vol. 2. Academic Press, New York, 1974.
- LUCHSINGER D. W.\*, ANGUS R. D., GUE C. S.\*, ANDERSON R. K.\*: The utilization of Brucella abortus culturing and biotyping in the epizootiologic investigation of bovine brucellosis. Proc. U.S. Anim. Health Assoc. 77:85-99, Oct. 1973. (publ. 1974)

- 41. MALMQUIST W. A., BROWN C. D. G.\*: Establishment of *Theileria parva* infected lymphoblastoid cell lines using homologous feeder layers. Res. Vet. Sci. 16(1):134-135, Jan. 1974.
- 42. MCCLURKIN A. W., PIRTLE E. C., CORIA M. F., SMITH R. L.: Comparison of low- and high-passage bovine turbinate cells for assay of bovine viral diarrhea virus. Arch. Gesamte Virusforsch. 45(3): 285-289, 1974.
- 43. MENGELING W. L.: Evaluation of agar gel immunodiffusion for detection of immunologic response of pigs to experimental infection with hemagglutinating encephalomyelitis virus. Amer. J. Vet. Res. 35 (11): 1429-1431, Nov. 1974.
- 44. MERKAL R. S., CURRAN B. J.\*: Growth and metabolic characteristics of *Mycobacterium paratuberculosis*. Appl. Microbiol. 28(2):276-279, Aug. 1974.
- 45. MICKELSON M. N.: Effect of uncoupling agents and respiratory inhibitors on the growth of *Streptococcus agalactiae*. J. Bacteriol. 120(2):733-740, Nov. 1974.
- MILLER J. M.: Animal model of human disease: Malignant lymphoma. Amer. J. Pathol. 75 (2):417-420, May 1974.
- 47. MILLER J. M., VAN DER MAATEN M. J.: A complement-fixation test for the bovine leukemia (Ctype) virus. J. Nat. Cancer Inst. 53(6):1699-1702, Dec. 1974.
- 48. MILLER J. M., VAN DER MAATEN M. J., GUSTAFSON G. A.: A comparison of the agar-gel diffusion and complement fixation tests for bovine C-type (leukemia) virus. Ann. Proc. Amer. Assoc. Vet. Lab. Diag. 17:207-214, Oct. 1974.
- MILLER L. D., PEARSON J. E., MUHM R. L.: A comparison of clinical manifestations and pathology of the equine encephalidites: VEE, WEE, EEE. Proc. U.S. Anim. Health Assoc. 77:629-631, Oct. 1973. (publ. 1974)
- 50. MOON H. W.: Pathogenesis of enteric diseases caused by *Escherichia coli*. Adv. Vet. Sci. Comp. Med. 18:179-212, 1974.

- 51. MUSCOPLAT C. C.\*, THEON C. O., CHEN A. W.\*, JOHNSON D. W.\*: Macrophage-dependent lymphocyte immunostimulation in cattle infected with Mycobacterium bovis and with Mycobacterium avium. Infec. Immunity 10(3):675-677, Sept. 1974.
- 52. OLSEN J. D., TRENKLE A.\*, WITZEL D. A., and McDONALD J. S.: Plasma growth hormone concentrations in cows before, during, and after parturition. Amer. J. Vet. Res. 35 (8):1131-1134, Aug. 1974.
- 53. PAGE L. A.: Application of an agar gel precipitin test to the serodiagnosis of avian chlamydiosis. Ann. Proc. Amer. Assoc. Vet. Lab. Diag. 17:51-61, Oct. 1974.
- 54. PAGE L. A., SMITH P. C.: Placentitis and abortion in cattle inoculated with chlamydiae isolated from aborted human placental tissue. Proc. Soc. Exp. Biol. Med. 146(1):269-275, May 1974.
- 55. PATTERSON I. M., ROEPKE M. H., DEYOE B. L.: Standardization of test-negative cream for Brucella milk ring test. Amer. J. Vet. Res. 35 (1):119-120, Jan. 1974.
- 56. PEARSON J. E., CARBREY E. A., GUSTAFSON G. A.: Bluctongue virus in cattle: Complement fixing antibody response and viremia in experimentally infected animals. Proc. U.S. Anim. Health Assoc. 77: 524-531, Oct. 1973. (publ. 1974)
- 57. PHILLIPS M., STONE S. S., PATTERSON J. M., PATTERSON R. M.: Isolation of bovine Brucella specific IgM antibody. Fed. Proc., Fed. Amer. Soc. Exp. Biol. 33 (3,pt.1): 799, March 1974 (abst. 3347).
- 58. PIER A. C., THURSTON J. R., and FICHTNER R. E.: Serological and immunological tests for nocardiosis in animals. Proc. Third Int. Conf. on Mycoses, Sao Paulo, Brazil, 1974.
- 59. PIER A. C., THURSTON J. R., RICHARD J. L., and CYSEWSKI S. J.: Mode of action by aflatoxins on resistance and immunity. IUPAC Proc., Poland,
- 60. PIRTLE E. C.: Preserved chicken erythrocytes for removing sodium lauryl sulfate and viral hemagglutinin from sodium lauryl sulfate-disrupted swine influenza virions. Amer. J. Vet. Res. 35 (6):825-827, June 1974.

- 61. PIRTLE E. C.: Titration of two porcine respiratory viruses in mammalian cell cultures by direct fluorescent antibody staining. Amer. J. Vet. Res. 35 (2):249-250, Feb. 1974.
- 62. PROCTOR S. J., ERICKSON G. A., GUSTAF-SON G. A.: Neurologic lesions of velogenic viscerotropic Newcastle disease virus in parrots, budgerigars, and canaries. Ann. Proc. Amer. Assoc. Vet. Lab. Diag. 17:115-122, Oct. 1974.
- 63. PROCTOR S. J., KEMP R. L.\*: Cryptosporidium anserinum sp. n. (Sporozoa) in a domestic goose Anser anser L., from Iowa. J. Protozool. 21(5):664-666, Nov. 1974.
- 64. REBERS P. A., HEDDLESTON K. L.: Immunologic comparison of Westphal-type lipopolysaccharides and free endotoxins from an encapsulated and a nonencapsulated avian strain of Pasteurella multocida. Amer. J. Vet. Res. 35 (4):555-560, April 1974.



- 65. RHOADES K. R., PHILLIPS M., YODER H. W. Jr.\*: Comparison of strains of *Mycoplasma gallisepticum* by polyacrylamide gel electrophoresis. Avian Dis. 18(1):91-96, Jan.-March 1974.
- 66. RICHARD J. L., THURSTON J. R., GRAHAM C. K.: Changes in complement activity, serum proteins, and prothrombin time in guinea pigs fed rubratoxin alone or in combination with aflatoxin. Amer. J. Vet. Res. 35 (7):957-959, July 1974.
- 67. RICHARDS W. D.: Phage susceptibilities of Mycobaterium bovis. Proc. of the 7th Intl. Sym. on Phage Typing of the Mycobacteria, Pisa, Italy. Sept. 1974.
- 68. RILEY J. L., COOK H. M.: A small, inexpensive radio-telemetering capsule for measuring rumen motility. Cornell Vet. 64 (2):225-232, April 1974.
- 69. ROEPKE M. H., PATTERSON J. M., DEYOE B. L.: *Brucella* ring test sensitivity of individual and pooled bovine milks with various preservatives. Amer. J. Vet. Res. 35 (1):115-118, Jan. 1974.
- 70. RUCKEBUSCH Y.\*, DOUGHERTY R. W., COOK H. M.: Jaw movements and rumen motility as criteria for measurement of deep sleep in cattle. Amer. J. Vet. Res. 35 (10):1309-1312, Oct. 1974.
- 71. SAWA T. R.\*, THOEN C. O., NAGAO W. T.\*: *Mycobacterium bovis* infection in wild axis deer in Hawaii. J. Amer. Vet. Med. Assoc. 165(11): 998-999, Dec. 1, 1974.
- 72. SCHERER R. K., BROWN R. W.: Differentiation of staphylococcal and micrococcal proteinases by electrophoresis. Appl. Microbiol. 28(5):768-773, Nov. 1974.
- 73. SEAWRIGHT, G. L., HARDING G.,\* THOMAS F. C.,\* HANSON R. P.\*: Microculture plaque neutralization test for California group arboviruses. Appl. Microbiol. 28 (5):802-806, Nov. 1974.
- 74. SHUMAN R. D., NORD N. A.: Serologic group relationship of P and U streptococci. Cornell Vet. 64 (3):376-386, July 1974.



- 75. SHUMAN R. D., WESSMAN G. E.: Swine abscesses caused by Lancefield's group E streptococci. XII. Specificity of serological tests for their detection with relation to nongroupable *beta* hemolytic streptococci. Cornell Vet. 64 (2):178-200, April 1974.
- SNYDER M. L., STEWART W. C., KRESSE J. I.: Laboratory confirmation of porcine enterovirus infections. Proc. Amer. Assoc. Vet. Lab. Diag. 17:105-113, Oct. 1974.
- 77. SONGER J. R., BRAYMEN D. T., MATHIS R. G., RILEY J. L.: Measuring respiratory rates and volumes of experimental swine. U.S. Agric. Res. Serv. ARS-NC-10, Jan. 1974. (5 pp.)

- 78. SONGER J. R., MATTHEWS P. J., BRAYMEN D. T., DENNIS D. E.: An ultrahigh-efficiency filter for use with flexible film germfree animal isolators. Lab. Anim. Sci. 24(6):943-945, Dec. 1974.
- 79. SONGER J. R., SULLIVAN J. F.: Safety in the biological laboratory. J. Chem. Educ. 51 (10): A481-A488, Oct. 1974.
- 80. STALHEIM O. H. V.: Effect of animal-passage and in vitro cultivation in homologous antiserum on leptospiral antigenicity. Arch. Exp. Veterinaermed. 28 (2): 243-247, March 1974.
- 81. STALHEIM O. H. V.: Urinary precipitate in porcine leptospirosis. Cornell Vet. 64(1):20-24, Jan. 1974.
- 82. STALHEIM O. H. V., HUBBERT W. T., FOLEY J. W.: Infectivity of two mycoplasmas of bovine origin in pregnant heifers. Amer. J. Vet. Res. 35(1):63-66, Jan. 1974.
- 83. STEWART W. C.: La maladie d'Aujeszky aux Etats-Unis, Cah. Med. Vet. 43:299-304, 1974.
- 84. STEWART W. C., CARBREY E. A., KRESSE J. I., SNYDER M. L.: Infections of swine with pseudorabies virus and enteroviruses: Laboratory confirmation, clinical and epizootiologic features. J. Amer. Vet. Med. Assoc. 165 (5):440-442, Sept. 1, 1974.
- 85. STONE S. S., DEYOE B. L.: Appearance of Brucella-specific immunoglobulins in synovia of neonatal calves after colostrum feeding. Amer. J. Vet. Res. 35 (9):1259-1261, Sept. 1974.
- 86. STONE S. S., STARK S. L., PHILLIPS M.: Transmissible gastroenteritis virus in neonatal pigs: Intestinal transfer of colostral immunoglobulins containing specific antibodies. Amer. J. Vet. Res. 35 (3):339-345, March 1974.
- 87. STONE S. S., TESSLER J.: Fluorescent labeling of antibody for indentifying Mycoplasma colonies by incident ultraviolet light. Amer. J. Vet. Res. 35(1): 107-110, Jan. 1974.
- 88. STRATING A., BUNN T. O.: Detection of etiologic agents in selected viral diseases. Proc. Amer. Assoc. Vet. Lab. Diag. 17:63-67, Oct. 1974.



- 89. TESSLER J., HESS W. R.\*, PAN I. C.\*, TRAUT-MAN R.\*: Immunofluorescence plaque assay for African swine fever virus. Can. J. Comp. Med. 38 (4): 443-447, Oct. 1974.
- 90. THAKE D. C., MOON H.W., LAMBERT G.: Epithelial cell dynamics in transmissable gastroenteritis of neonatal pigs. Vet. Pathol. 10(4):330-341, 1973.
- 91. THOEN C. O., KARLSON A. G.\*, ELLEFSON R. E.\*: Comparison of serum lipid and lipoprotein profiles of tuberculin-positive and tuberculin-negative monkeys (Macaca sp). Amer. Rev. Resp. Dis. 108(3): 686-687, Sept. 1973.



- 92. THOEN C. O., RICHARDS W. D., JARNAGIN 95. VAN DER MAATEN M. J., MILLER J. M., I. L.: Comparison of six methods for isolating mycobacteria from swine lymph nodes. Appl. Microbiol. 27 (3):448-451, March 1974.
- 93. THURSTON J. R., DEYOE B. L., BAETZ A. L., RICHARD J. L., BOOTH G. D.: Effect of aflatoxin 96. on serum proteins, complement activity, and the antibody response to Brucella abortus in guinea pigs. Amer. J. Vet. Res. 35 (8):1097-1100, Aug. 1974.
- 94. VAN DER MAATEN M. J.: Bovine RNA tumor viruses. Proc. U.S. Anim. Health Assoc. 77:435-443, Oct. 1973. (publ. 1974)

- BOOTHE A. D.: Replicating type-C virus particles in monolayer cell cultures of tissues from cattle with lymphosarcoma. J. Nat. Cancer Inst. 52 (2):491-497, Feb. 1974.
- WOOD R. L.: Isolation of pathogenic Erysipelothrix rhusiopathiae from feces of apparently healthy swine. Amer. J. Vet. Res. 35 (1):41-43, Jan. 1974.
- 97. WRIGHT H. S.: Virucidal activity of commercial disinfectants against velogenic viscerotropic Newcastle disease virus. Avian Dis. 18(4):526-530, Oct.-Dec. 1974.



#### RESEARCH PROGRAMS

BOVINE MASTITIS

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